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MM31/1026

EXAMINER
WHIPPLE, M

ART UNIT	PAPER NUMBER
2813	6

DATE MAILED: 10/26/98

Please find below and/or attached an Office communication concerning this application or
proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
08/636,069

Applicant(s)
Sandhu et al.

Examiner
Matthew Whipple

Group Art Unit
2813



☒ Responsive to communication(s) filed on Dec 1, 1997

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-30 is/are pending in the application.

Of the above, claim(s) 27-29 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-26 and 30 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Election/Restriction

1. Newly submitted claims 27-29 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the product claimed could be used in a materially different process, such as for ozone cleaning.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 27-29 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Specification

2. The amendment filed 12/1/97 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: that the lamps be positioned to illuminate the reaction volume of gas "above the surface of the substrate". Applicant's disclosure does not teach where the illumination of the gas volume occurs in relation to the substrate, such as "above" the substrate. Furthermore, applicant has removed from the specification the teaching of "illuminating the reaction surface of the substrate", which is also seen as introducing new matter.

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Applicant is required to cancel the new matter in the reply to this Office action.

Claim Rejections - 35 USC § 112

3. Claims 1, 23, 25, and 26 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1, 23, and 26, it is not clear what the meets and bounds of “a chemically reactive distance of the substrate” would be.

It is also not clear what the general idea applicant intends to convey by the phrase “a gas volume located within a chemically reactive distance of the substrate”. The confusion arises because applicant’s description of the gas volume as being located where heterogenous reactions (surface reactions) take place and the fact that the gas volume is “within a chemically reactive distance of the substrate” would lead one of ordinary skill in the art to believe the that particular volume of gases were reacting with the surface of the substrate or at least extremely near the surface of the substrate in order to be able to react with the substrate. However, the gas volume is being illuminated using an incoherent light source, while the substrate is not. How does one illuminate gases which are within a chemically reactive distance of the substrate without illuminating the substrate? Because of this apparent contradiction, it is unclear what applicant intends by “a gas volume located within a chemically reactive distance of the substrate”.

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In claim 25, there is no antecedent basis for "the selected compound". Further, the meets and bounds of "a low fixed charge" are not clearly discernable.

4. Claims 1-24 and 26 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. For the reasons given above, one of ordinary skill in the art would not understand how to illuminate "a gas volume located within a chemically reactive distance of the substrate" without illuminating the substrate.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 25 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 2-050966 (Hisamune).

Hisamune clearly teaches applicant's invention (see Purpose and Constitution). Because the process is very similar, including using the same source gases illuminated by a mercury lamp, the fixed charge of the resulting layer would be "low". Note also that the meets and bounds of "low" are not set forth the term may be construed broadly.

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Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-24 and 26 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 2-050966 (Hisamune).

Hisamune clearly teaches applicant's process of illuminating ozone and a silicon source gas with a mercury arc lamp to deposit silicon dioxide onto a wafer surface. Further, Hisamune teaches a deposition temperature of about 400° C and applicant claims about 480° C.

Temperatures about 400° C, such as 440° C, would also be about 480° C. Therefore, the Hisamune reference anticipates applicant's deposition temperature. Hisamune further teaches that the reason for irradiating the inside of the reaction furnace with UV radiation is to induce a photochemical reaction of the gaseous starting materials with ozone (translation, p. 5, lns. 20-21). It is not taught that it is not necessary to illuminate the substrates.

However, it would have been obvious to one of ordinary skill in the art that the lamps may be placed in any manner, including so as not to illuminate the surface, because Hisamune teaches to induce a photochemical reaction of the gaseous starting materials with ozone, which requires only that the gases be illuminated. This teaching suggests that the substrate need not be

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illuminated. Indeed, Hisamune never teaches that the substrates need be illuminated, but instead broadly teaches illuminating the inside of the "reaction chamber". Further, applicant does not provide any reason or benefit for not illuminating the wafer, but merely states that "It is not necessary . . . to illuminate the substrate surface" (p 7, lns. 23-25). In fact applicant's original specification taught to "uniformly illuminate the reaction surface of the substrate" (pg. 6, ln. 6). Therefore, applicant's invention is not seen as providing a patentable distinction over the prior art.

Alternatively, if it is somehow seen that applicant's deposition temperature is not anticipated, then this would be a difference.

It has been held that optimization of parameters is obvious (see *In re Aller* 105 USPQ 233 (CCPA 1955)).

Therefore, it would have been obvious to choose the temperature of applicant's claimed process because Hisamune teaches temperatures near applicant's and to provide an efficient deposition process which provides a quality silicon oxide film, according to the precedent set by *In re Aller*.

Response to Arguments

9. Applicant's arguments filed 12/1/97 have been fully considered but they are not persuasive. Applicant has argued that it is not taught or suggested to optically excite the volume of gas located within a chemically reactive distance of the substrate, without exposing the substrate

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assembly surface. However, this teaching is suggested by the Hisamune reference, for the reasons given in the above rejections.

Conclusion


10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 4,916,091 (Freeman et al.) also teaches a process similar to applicant's claims (see col. 16, ln. 63 to col. 17, ln. 55).


11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Whipple whose telephone number is (703) 308-2521.


MLW
October 22, 1998


Charles Bowers
Supervisory Patent Examiner
Technology Center 2800